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Comptroller General
of the United States

Washington, D.C. 20548

156213

REDACTED VERSION'

Decision

Matter of: Newport News Shipbuilding and Drydock Company; Ingalls Shipbuilding, Inc.

File: B-254969; B-254969.2; B-254969.3; B-254969.4

Date: February 1, 1994

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Michael L. Burack, Esq., Stuart P. Green, Esq., and Steven F. Cherry, Esq., Wilmer, Cutler & Pickering, for National Steel and Shipbuilding Company; Caryl A. Potter, III, Esq., C. Patterson Cardwell IV, Esq., Margaret S. Determan, Esq., and Joseph P. Hornyak, Esq., Sonnenschein, Nath & Rosenthal, for Avondale Industries, Inc., interested parties.
Harold A. Cohn, Esq., and Scott Garner, Esq., Department of the Navy, for the agency.
David A. Ashen, Esq., and John M. Melody, Esq., Office of the General Counsel, GAO, participated in the preparation of the decision.

DIGEST

Protest of agency selection of single ship class on which to base cost model is denied where agency has reasonably established that selected ship class is the one most similar to the strategic sealift ships being procured for which detailed, reliable and useful cost data were available, and thus, the class most likely to provide useful cost estimating relationships; agency reasonably determined that addition of dissimilar ships for which useful and reliable cost data was not available could not reasonably be expected to improve the model.

'The decision dated February 1, 1994, contained confidential or source selection sensitive information and was subject to a General Accounting Office protective order. This version of the decision has been redacted. Deletions in text are indicated by "[deleted]."

DECISION

Newport News Shipbuilding and Drydock Company (NNS) and Ingalls Shipbuilding, Inc. protest the Naval Sea Systems Command's (NAVSEA) award of contracts to Avondale Industries, Inc., and National Steel and Shipbuilding Company (NASSCO), under request for proposals (RFP) No. N00024-93-R-2200, for the construction of strategic sealift ships. NNS and Ingalls challenge NAVSEA's conduct of discussions and evaluation of price proposals.

We deny the protests.

BACKGROUND

Based upon assessments of the strategic sealift requirements following Operations Desert Shield and Desert Storm, the Navy identified a need for large, medium speed roll-on/roll-off (RO/RO) ships to serve in both the prepositioning role--forward deployed ships loaded with military equipment--and surge role--ships stationed in the United States and immediately available for loading. As an initial step to meet this strategic sealift requirement, NAVSEA issued a solicitation--RFP No. N00024-93-R-2214--for the engineering design development and detailed design and conversion of existing ships. On July 30, 1993, NAVSEA awarded conversion contracts to NASSCO (for three ships) and to NNS (for two ships).

Meanwhile, on October 2, 1992, NAVSEA issued the current RFP for new strategic sealift RO/ROs. The solicitation contemplated the award under phase one of multiple, firm-fixed-price engineering design development contracts. Under phase two, the solicitation contemplated the award to as many as three phase I contractors of fixed-price incentive contracts for the detailed design and construction of up to a total of 18 RO/ROs.[1] The solicitation permitted offerors to propose prices for 6-ship (1 base and 5 option) and 12-ship (2 base and 10 option) quantities. The RFP provided

[1]In fixed-price incentive contracts, the amount of the contractor's profit is determined by the share ratio formula established in the contract--here 50/50--which rewards the contractor with additional profit for efficient performance (resulting in a cost lower than the proposed target cost), and penalizes the contractor for inefficient performance (resulting in a cost higher than the proposed target). The share ratio determines the government's and contractor's relative share in the overrun or underrun amount. The final price is limited to the agreed ceiling price. Federal Acquisition Regulation § 16.403.

for the award of phase II construction contracts to those offerors whose conforming offers would be most advantageous to the government based on evaluation of the following three factors (in descending order of importance): (1) price; (2) selected ship characteristics, including square footage of RO/RO decks, speed and range; and (3) evaluated operation and support costs for a 40-year period, that is, estimated costs factored downward to give greater weight to final contract dollars. The solicitation cautioned, however, that "[n]otwithstanding the results of the 'best value' evaluation . . . the Government reserves the right to make multiple contract awards on the basis of industrial mobilization considerations".

The solicitation provided for NAVSEA to consider the realism of proposed prices and, if necessary, to calculate and evaluate the most probable cost of offers. Specifically, the RFP cautioned that:

> "(a) Experience in Navy programs indicates that a contract awarded to a contractor submitting an unrealistically low price proposal (whether resulting from a decision on the part of the contractor to submit a price below anticipated costs; from inaccurate, incorrect or improper assumptions in the cost, technical, or other areas or from a lack of understanding of the contract requirements; from other circumstances) may cause problems for the Navy as well as the contractor during contract performance. Accordingly, should the Navy, in the exercise of its judgment, determine that the proposed target price . . . is unrealistically low, the Navy will not use the proposed target price for purposes of arriving at a total evaluated price, but will use, instead, an 'Estimated Final Price to the Government'. . . .
>
> "(b) In the event the Navy determines that an offeror's proposed target prices . . . are unrealistically low, a detailed review of the offeror's pricing proposal will be made to assess and evaluate the realism of the offeror's proposed target prices. The Government will evaluate the realism of this target price by considering the offeror's proposed labor hours, labor rates, material costs burden rates and other costs in light of data available to the Contracting Officer, including the relationship of such proposed labor hours and costs to the effort described in the offeror's technical proposal, the degree of technical and cost risk associated with the offeror's proposed Contract Design, and Government estimates for: (1) direct labor hours, (2) material costs,

(3) direct labor costs, (4) overhead and G&A [general and administrative] costs, and (5) any other costs which are likely to be incurred by the offeror in performance of the requirements of the solicitation."

The solicitation provided for calculation of the estimated final price to the government in accordance with the solicitation's incentive price clause; accordingly, the estimated final price would be calculated utilizing the required 50/50 share ratio--between the government and the contractor--for costs in excess of the proposed target costs.

On November 20, 1992, engineering design development contracts were awarded to seven contractors--Avondale, NASSCO, NNS, Ingalls, and three others--under phase I of the new construction procurement. The seven development contractors submitted technical proposals and contract designs for new strategic sealift RO/ROs by May 20, 1993, and draft specifications on June 14; they submitted initial price proposals on June 21.

NAVSEA ultimately determined that no single award would be made for more than six ships in order to preserve the industrial mobilization base. Six of the seven offers were found technically acceptable for a six-ship quantity. The agency further concluded that all proposed ships were essentially equal with respect to speed and range. Accordingly, NAVSEA evaluated best value based on the sum of the total evaluated price--proposed or estimated, as appropriate--and the operation and support costs, divided by square feet of RO/RO deck space--i.e., life-cycle cost per square foot.

NAVSEA developed a government estimate for the cost of new construction for each offeror based on a parametric cost model using cost estimating relationships--manhours per long ton and material dollars per long ton--for various ship's work breakdown structure groups derived from actual return cost data for the Navy's T-AO 187 fleet oiler. The T-AO 187 cost estimating relationships were adjusted to reflect the larger ship size and greater complexity--with respect to heating, ventilation, air conditioning, and fire fighting systems--of the proposed strategic sealift RO/RO designs. In addition, adjustments were made for certain shipyard-specific efficiencies or inefficiencies. The adjusted cost estimating relationships were then applied against NAVSEA's independent weight estimate for each offeror's design to determine estimated manhours and material dollars. For each offeror, shipyard-specific labor, overhead and cost of money rates were applied to the estimated manhours to determine production, design/engineering and production support costs. Manhours for the follow-on ships after the lead ship were

estimated by applying a 90-percent learning curve,[2] (NAVSEA assumed no material learning--that is, assumed a 100-percent material learning curve.) Finally, vendor-supplied quotes and data were used in certain equipment and material areas. Tr. at 102-127; 222-251.

Although NASSCO's initial proposal offered the lowest target price, NAVSEA estimated that NASSCO would exceed its proposed target cost by [deleted], resulting in a loss to the company of approximately [deleted] (after accounting for the 50/50 share ratio and NASSCO's proposed profit); the agency therefore found NASSCO's price unrealistically low. Accordingly, for purposes of evaluation, NASSCO's target price was replaced by the estimated final price to the government, resulting in an increase of [deleted] in NASSCO's evaluated price. While Avondale, NNS, and two other offerors were also expected to exceed their proposed target costs, after application of the 50/50 share ratio, and given their proposed profit, all were expected to earn a profit and their prices therefore were not found to be unrealistically low. For example, although the expected cost of NNS's proposal ([deleted]) exceeded its proposed target cost ([deleted]) by [deleted], given the 50/50 share ratio and NNS's proposed profit ([deleted]), NNS was expected to earn a profit of [deleted].

After substitution of the evaluated final price to the government for NASSCO's unrealistically low proposed target price, the life-cycle cost (LCC) per square foot of cargo space offered by Avondale's proposal was evaluated as low, as set forth below:

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[2]Generally, under a 90-percent learning curve, doubling the number of units (ships) reduces manhours (or costs) by 10 percent, such that the manhours required for the sixth unit is only approximately 76.2 percent of the manhours required for the lead unit. Hearing Transcript (Tr.) at 390.

Initial Proposals
Surge Scenario
(6 Ships)

	Acquisition Cost	Operation & Support Cost	LCC	LCC/ SQ. FT.
	(millions)	(millions)	(millions)	
Avondale	$1,304.6	[deleted]	[deleted]	[deleted]
NASSCO	1,295.7	[deleted]	[deleted]	[deleted]
NNS	1.668.3	[deleted]	[deleted]	[deleted
Ingalls	1,654.1	[deleted]	[deleted]	[deleted]
Next Low	1,702.5	[deleted]	[deleted]	[deleted]

After determining that no other offeror could reduce its price sufficiently to offset Avondale's evaluated LCC advantage without being found unrealistically low, NAVSEA included Avondale's proposal in a competitive range of one for an initial six-ship (one base and five option) award and included the remaining offers in another competitive range for a second six-ship award.

NAVSEA then commenced discussions with all offerors. In its initial August 26 discussion letter to NNS, NAVSEA advised NNS that "[w]hile your price proposal was not determined to be unrealistically low, it appears that your final cost may exceed your proposed target cost." On August 31, NNS responded that it had:

> "[r]eviewed its price proposal relative to material costs, engineering, and production hours for the six-ship proposal. We believe that our price proposal realistically reflects the overall effort described in our design submittals and technical proposal. Therefore, we have found no reason to review our proposal, however, all cost factors will be considered upon submission of our best and final offer."

In its letter of August 26 to NASSCO, NAVSEA advised that:

> "Your proposed material costs, engineering and production hours do not reflect the effort described in your technical proposal and . . . your proposed price is unrealistically low.
>
> . . . . .

> "The Government's evaluation indicates that you will exceed the proposed target cost by [deleted]. Identify the source and timing of funding that would be available to NASSCO to continue contract performance under this effort if an overrun of that magnitude in fact occurred."

Upon reviewing NASSCO's written response dated August 31, however, NAVSEA concluded that it had failed to adequately communicate the magnitude of the projected overrun; it appeared that NASSCO understood the overrun to total approximately [deleted], of which its share would be approximately [deleted], instead of the evaluated total overrun of [deleted]. Tr. at 37-38, 140. Accordingly, by letter of September 2, NAVSEA advised NASSCO that the:

> "statement contained within the question of 'you will exceed the proposed target cost by [deleted]' was intended to represent our projection of your share of a potential [deleted] overrun, and not the full amount of the overrun. The approximate amounts provided during the telecon [of August 27] on a per ship basis were also intended to represent your share."

In addition, NAVSEA advised NASSCO that "[y]our proposed manhours for SWBS [ship's work breakdown structure] groups 100 [hull structure] and 500 [auxiliary systems] are unrealistically low, by approximately 40% and 50% respectively"; "your proposed SWBS group 500 material costs are low by approximately 32%"; and the "new construction design and engineering hours (SWBS 800) appears low."

On September 2, NAVSEA made award to Avondale for the initial 6-ship quantity at an announced total price of $1,302,732,387. Best and final offers (BAFO) were requested from the remaining offerors by discussion letters of the same date. In its BAFO, NASSCO increased its target cost by $163,959,479; as a result, its expected profit was calculated by NAVSEA as [deleted], and its target price was no longer considered to be unrealistically low. In contrast, both Ingalls and NNS (notwithstanding the agency's warning during discussions of a projected overrun) substantially reduced their BAFO prices; Ingalls reduced its target price by $255,277,000 and NNS by $303,218,274. As a consequence, their proposed prices were found to result in an expected loss of [deleted] and [deleted], respectively, and to be unrealistically low; accordingly, estimated final prices to the government were substituted, increasing Ingalls's evaluated price by [deleted] million and NNS's by [deleted] million. As a result, NASSCO's LCC per square foot was evaluated as low, as set forth below:

BAFO
Surge Scenario
(6 Ships)

	Acquisition Cost	Operation & Support Cost	LCC	LCC/ SQ. FT.
	(millions)	(millions)	(millions)	
NASSCO	$1,293.4	[deleted]	[deleted]	[deleted]
Evaluated NNS	1,511.6	[deleted]	[deleted]	[deleted]
Evaluated Ingalls	1,501.2	[deleted]	[deleted]	[deleted]
Next Low	1,573.9	[deleted]	[deleted]	[deleted]

Given NAVSEA's previous determination that all proposed ships were essentially equal with respect to speed and range, and NASSCO's low evaluated LCC per square foot of cargo space, the agency determined that NASSCO's BAFO was most advantageous to the government and accordingly awarded it the second six-ship quantity. Ingalls and NNS thereupon filed these protests.

DISCUSSIONS

NNS and Ingalls contend that the agency improperly coached NASSCO by providing that firm during written discussions with the government estimate, including both the overall estimated overrun ([deleted]) and the estimate in critical areas (e.g., "your proposed manhours for SWBS groups 100 and 500 are unrealistically low by approximately 40% and 50% respectively"), such that NASSCO knew by how much it had to increase its price and profit in order to avoid having its price be found unrealistically low. NNS and Ingalls note that, in contrast, NAVSEA never advised them of the detailed government estimate for their proposals.[1]

[1]Ingalls alleges that while NAVSEA advised NASSCO of the opportunity for oral discussions when its representative picked up its August 25 and September 2 discussion letters, the Ingalls representative was not advised of such an opportunity. Although the record is unclear as to whether all offerors were specifically advised of the opportunity for oral discussions, in fact both Ingalls and NNS contacted NAVSEA by telephone to seek clarification of the discussion letters and the response expected of the offerors. Tr. at 24-25, 33-34, 165, 427-428, 457-458, 707-708, 935-936.

A contracting agency properly may disclose a price objective to an offeror as a negotiation tool for reaching an agreement as to a fair and reasonable price, Racal Guardata, Inc., 71 Comp. Gen. 219 (1992), 92-1 CPD ¶ 159, although where the agency discloses the government estimate to only some offerors it runs the risk that the discussions will be rendered unfair and prejudicial to the other offerors. Cf. Bank Street College of Education, 63 Comp. Gen. 393 (1984), 84-1 CPD ¶ 607 (not improper to discuss government cost estimate with awardee but not protester where only the awardee's proposed costs were above the government estimate).

Here, even if NNS and Ingalls are correct that it was improper to inform only NASSCO of the detailed government estimate, had the agency provided NNS and Ingalls with the equivalent information for their proposals, the outcome would have been the same. In this regard, the benefit NASSCO arguably obtained from the specific information it received was being able--unlike NNS and Ingalls--roughly to calculate the price at which its proposal would be found unrealistically low. Based on this figure, it was able to modify (i.e., increase) its BAFO target price precisely enough that the agency would not find the price unreasonably low and thus discard that price and use the higher "Estimated Final Price to the Government" in evaluating NASSCO's proposal. If the protesters had been furnished equivalent information, it would have provided them with the same benefit--it would have allowed them roughly to calculate the price below which their proposals would be deemed unrealistically low. Since (the record shows) the lowest realistic prices for the protesters under the original government estimate were higher than NASSCO's BAFO price (because both protesters' costs of performance were inherently higher than NASSCO's), neither would have moved into line for award basing their BAFO prices on this calculation.[4] See Racal Guardata, Inc., supra (where alleged improper discussions did not prejudice the protester, protest will not be sustained).

PRICE REALISM

NNS and Ingalls challenge NAVSEA's determination that their BAFO prices, which reflected a reduction from their initial prices of approximately $303.2 million (20 percent) and $255.3 million (16 percent) respectively, were unrealistically low and the consequent substitution of an

[4]Although the government estimates for all three offerors were reduced after submission of BAFO prices, the agency never disclosed any revised estimates.

estimated final price to the government for purposes of evaluation.

The evaluation in this regard was based on NNS's and Ingalls' failure to present certain specifically required cost information, and their failure to substantiate significant price reductions in their BAFOs. This resulted in the agency's concluding that the firms' proposed prices were unrealistically low. Tr. at 303-304.

Background

The solicitation required the submission of extensive cost and pricing data, including: (1) a summary NAVSEA cost accounting form (Unit Price Analysis--Basic Construction--Form 4280/2); (2) a detailed NAVSEA cost accounting form (Unit Price Analysis Summary--Ship's Work Breakdown Structure--Form 4280/2A); (3) identification of each major area of subcontracting and the appropriate major ship's work breakdown area; (4) "backup data, upon which the offer is based . . . traceable to past performance," including work sheets identifying nonrecurring manhours and material costs for the elements of design, engineering, construction, and support; (5) "the cost estimate which was prepared to the offeror's own accounting subdivisions, along with backup sheets showing, in addition to labor manhours and material costs, the material quantities, unit prices and cost estimating relationships upon which the offer was based"; and (7) an outline of current/past ship construction and/or conversion and repair efforts . . . used as the basis to develop the manhour and material portions of the proposal" in each of the major ship's work breakdown structure groups. In addition, the solicitation provided that where an offeror "intends to use new and innovative techniques as significant improvement in cost, the nature of these techniques and their impact on cost or price shall be explained and linked to current performance." Further, the solicitation specifically required that any "'Management cost adjustment' or similar reductions to the offeror's proposal prices . . . be supported by the same data as stated above." Finally, the solicitation required that the price proposals be consistent with technical proposals and that any differences be fully explained.

NNS included in its BAFO a revised solicitation price schedule (Section B), revised target cost, target profit, target price and ceiling price numbers, and a revised NAVSEA summary form 4280/2, summarizing manhours and material costs for the nine major ship's work breakdown structure groups--e.g., hull structure, propulsion plant, electric plant. NNS, however, did not include a revision of NAVSEA form 4280/2A, the detailed ship's work breakdown structure analysis required by the solicitation and which provided for

the entry of manhours and material costs for approximately 350 ship's work breakdown structure subgroups. Nor did NNS furnish the other detailed supporting documentation described above for its reduction in price, as required by the solicitation.

NNS's narrative substantiation of the 20 percent reduction in its BAFO target price amounted to only 1 1/2 pages of text. NNS reduced its production manhours for the lead ship by 15 percent, and reduced the manhours for the follow-on ships by 20-38 percent, in effect projecting a learning curve calculated by the agency as approximately [deleted] percent (in contrast to the [deleted]-percent curve in its initial proposal). NAVSEA found the [deleted] percent learning curve to be "extremely aggressive" and one which, to its knowledge, had never been achieved on a major shipbuilding program. NNS justified the increased labor savings on the basis of improvements in labor efficiency achieved in its construction of nuclear aircraft carriers and nuclear attack submarines. NAVSEA, however, determined that NNS failed to document the projected savings. The agency observed that the claimed improvement in labor efficiency on the aircraft carriers was overstated since: (1) the figures were skewed by extensive design changes and acceleration in schedule for the lead aircraft carrier (thus inflating the manhours for that ship relative to the follow-on ships); and (2) the government's estimate for completion of the last aircraft carrier exceeded NNS's. NAVSEA also found that NNS failed to document the claimed labor improvements on submarine construction. The agency reports that the value of the submarine data is reduced by significant claims, delays and performance problems, and by the fact that the submarines are more complex ships. The agency concluded that, in any case, any such improvements would not directly translate into labor savings on the strategic sealift ships, which are to be built to commercial standards, and not the military standards used for the submarines (and for the aircraft carriers). The agency also determined that NNS had furnished no substantiation for the realism of a claimed $89 million reduction in the target price of a fixed-price incentive subcontract to be awarded to Ingalls (to which NNS proposed to subcontract 54 percent of the "work scope"). As a result, although NAVSEA reduced the government estimate for NNS's BAFO by 6.1 percent, the agency determined that NNS still would exceed its BAFO target cost by approximately [deleted], resulting in an overall loss to the firm of [deleted] after accounting for the 50/50 share ratio and NNS's proposed profit.

While Ingalls included in its BAFO a revised solicitation price schedule (Section B), revised target cost, target profit, target price and ceiling price numbers, a revised NAVSEA form 4280/A (summarizing the nine major ship's work

breakdown structure groups), it too (like NNS) failed to furnish the detailed NAVSEA form 4280/2A (detailing the approximately 350 ship's work breakdown structure subgroups). Furthermore, while Ingalls explained the basis for its labor and overhead rates, it offered no rationale for its reduction in production manhours--12 percent on the lead ship and 8-11 percent on the follow-on ships--or its material reductions--3 percent on the lead ship and 11-15 percent on the follow-on ships. As a result, although NAVSEA reduced its estimate for Ingalls's BAFO by 2.1 percent, the agency determined that Ingalls still would exceed its BAFO target cost by [deleted], resulting in a loss of [deleted] after accounting for the 50/50 share line and Ingalls's proposed profit.

Analysis

NNS and Ingalls raise numerous arguments to the effect that the cost model used by NAVSEA in determining price realism was both fundamentally flawed and applied unreasonably. Our review of the record, however, provides no basis for concluding that NAVSEA's evaluation was flawed so as to prejudice the protesters or that the agency otherwise acted unreasonably in finding NNS's and Ingalls' BAFO prices to be unrealistically low. We discuss several of the protesters' arguments below.

Baseline Ship

NNS and Ingalls first contend that NAVSEA's reliance on a single class of vessel, the T-AO 187 fleet oiler, as the primary source for the cost estimating relationships used in its cost model was unreasonable. In this regard, the protesters note that the Department of Defense Cost Analysis Improvement Group (CAIG) and the Department of the Navy's Naval Center for Cost Analysis (NCA), which reviewed this procurement for budgetary (not source selection) purposes, relied upon a different, more extensive universe of baseline ships as the basis for their cost models.

NAVSEA states, however, that the T-AO 187 is the vessel most similar to the strategic sealift ships (and therefore the vessel whose cost estimating relationships required the fewest adjustments), for which it had the detailed and reliable cost information necessary for an accurate cost model. NAVSEA explains in this regard that the T-AO 187, a steel-hull ship built to commercial standards, provided a good model for estimating the cost of the hull and structure of the strategic sealift ships; the hull and structure comprised approximately 75 percent of the light ship weight and was the largest single element of ship cost. Further, according to the agency, the T-AO 187 was built from 1982 to 1986 using new technology and new manufacturing processes

which are representative of current technology used in the industry. Tr. at 230.

As for the availability of more extensive cost data, NAVSEA notes that the CAIG agreed that the T-A0 187 was one of four classes of Navy ships built to American Bureau of Shipping (commercial) standards for which cost data was readily available. Although the CAIG also relied upon three other ship classes--the T-AGOS 19, T-AGS 39, and T-AK3008--for its cost model, NAVSEA considered them to be less useful as baseline ships for the strategic sealift ships than is the T-A0 187. NAVSEA explains in this regard that the T-AGOS 19 is an extremely poor analogy because: (1) it has a SWATH (small water plane area twin hull) hull design which is completely different from the strategic sealift ship hull designs; (2) the T-AGOS 19's displacement (3,100 light tons) is only 1/10th that (32,000 light tons) of the strategic sealift ships; (3) there is a higher percentage of machinery and outfitting on the T-AGOS 19, which skews cost estimating relationships because those elements are more expensive than structure on a cost per ton basis; and (4) there were large contractor claims which further skewed the cost data. Tr. at 268, 283, and 348. NAVSEA determined, furthermore, that the available cost data for the T-AGS 39 (an oceanography ship) actually is less detailed and less reliable than the data for the T-A0 187, since there is no visibility into the cost of the single work breakdown structure groups, and the class involved large contractor claims (which, again, tend to skew the cost data). In addition, the T-AGS 39 (8,810 light tons) is even smaller than the T-A0 187 (14,711 light tons) and significantly smaller than the strategic sealift ships (approximately 32,000 light tons). Finally, NAVSEA considered the T-AK 3008 RO/RO ship to be the closest ship in weight (19,800 light tons) and characteristics to the T-A0 187. It notes, however, that the CAIG itself did not consider the return cost data for the class to be reliable, since: (1) the cost information was not available in standard Navy format; (2) the costs "are known only at the top line, with little visibility into the cost details"; and (3) the cost data was for a lot purchase of all five ships in the class, with no visibility into the costs of the lead ship--which generally is more expensive--relative to the follow-on ships.

As for NCA's selected baseline ships, NAVSEA maintains that they furnish even less useful analogies because: (1) all were commercial ships for which only price, and not cost, was available, and there was no indication as to whether the contracts were profit or loss contracts; (2) the ships were less than 1/2 as expensive as the strategic sealift ships; and (3) only 1 of the ships was constructed after the T-A0 187, while 6 of the 11 were constructed more than

10 years prior--they thus used older technology and processes not representative of those to be used on the strategic sealift ships. NAVSEA further notes that unlike the agency, neither the NCA nor the CAIG made adjustments in their cost models for ship characteristics different from those on the strategic sealift ships.

NAVSEA also does not consider the baseline ships selected by NNS and Ingalls to provide as useful analogies as does the T-A0 187. Since the Ingalls baseline ship (the LHD 2) and the ships cited by NNS in support of its BAFO reductions (nuclear aircraft carriers and nuclear attack submarines) were built to military specifications rather than commercial standards (as was the T-A0 187) applicable to the strategic sealift ships to be built, the agency does not believe them to be at all comparable for cost evaluation purposes. Tr. 269, 602-603. The CAIG itself seemed to agree that ships built to military specifications provide poor analogies; according to the CAIG, "[t]he principle difference between the commercial ABS [American Bureau of Shipping] standards and the higher military requirements standards are in the areas of quality control, material specifications, and testing, factors which greatly influence costs." Indeed, Ingalls's own director of estimating and cost engineering has stated that it would "be kind of ridiculous" to estimate costs for a strategic sealift ship using nuclear aircraft carriers or nuclear attack submarines, and an NNS executive vice president has stated that "[y]ou certainly couldn't use a nuclear submarine or nuclear carriers" as baseline ships. Tr. at 608, 725. NAVSEA also questions NNS's selection as baseline ships of the ultra-large crude carriers (ULCC) which it had built. Although the agency agrees that they are as similar in some respects to strategic sealift ships as is the T-A0 187, it notes that the ULCC's are older ships which were constructed in the 1970's, while the T-A0 187 was delivered in 1986, constructed with more advanced and efficient shipbuilding technology and processes, and includes more machinery components similar to the strategic sealift ship than did the ULCC's. Tr. at 259-260, 269.

NAVSEA's rationale for selecting the T-A0 187 as the baseline for its cost model was reasonable. See Allied-Signal Aerospace Co., B-250822; B-250822.2, Feb. 19, 1993, 93-1 CPD ¶ 201. We find that the agency has reasonably established that the T-A0 187 class is the most similar to the strategic sealift ships for which detailed, reliable and useful cost data were available, and thus the class most likely to provide useful cost estimating relationships. While it would logically seem advantageous to base a cost model on additional similar ships, NAVSEA has shown that there were no such additional ships for which useful and reliable cost data was available; we agree with NAVSEA that

the addition of dissimilar ships for which useful and reliable cost data were not available could not reasonably be expected to improve the model. We note that cost estimating is necessarily judgmental in nature; we will not overturn agency judgments unless they are clearly unreasonable. Continental Maritime of San Francisco, Inc.--Recon., B-220632.2, Apr. 9, 1986, 86-1 CPD ¶ 351; see Phoenix Medical Elecs. Servs., Inc., B-237739, Mar. 21, 1990, 90-1 CPD ¶ 312.[5]

Turbine Engines and Reduction Gears

NNS challenges NAVSEA's evaluation of the costs of turbine engines and reduction gears. The protester notes that while the agency apparently evaluated the cost of these items for NASSCO at [deleted] million less (for 6 ships) than set forth in NASSCO's BAFO, no similar adjustment was made for NNS. NAVSEA explains, however, that the adjustments were based on vendor quotes which demonstrated that NASSCO actually would obtain gas turbine engines and reduction gears for less than allowed for in its proposal. NAVSEA followed a similar course with respect to NNS's proposal, relying upon vendor quotes in estimating the cost of NNS's proposed diesel engines and reduction gears. Although NNS alleges that the agency did not consider the "price" NNS included in its proposal for the items, the protester concedes that the agency could not know this figure because the items were to be supplied by Ingalls under its subcontract to NNS, and NNS failed to furnish NAVSEA with any detailed cost and pricing data for the Ingalls subcontract. Tr. at 988-993. We conclude that NAVSEA's approach to estimating the cost of turbine engines and reduction gears was reasonable.

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[5]In any case, the record does not indicate that either NNS or Ingalls was prejudiced by NAVSEA's selection of baseline ships different from those selected by the CAIG and NCA. The CAIG and NCA estimates of acquisition cost were generally higher than NAVSEA's, and thus, if NAVSEA had accepted the CAIG's or the NCA's estimating approach, the result would have been a finding of a greater, not lesser, expected overrun on the part of the protesters. Further, the agency reports that when the CAIG and NCA estimates are adjusted to account for the fact that were based on seven (rather than six) ships and to use NAVSEA's estimate of operation and support costs (which have not been challenged by the protesters), the estimated life-cycle costs on a square foot basis of NNS's and Ingalls's ships remain higher than both Avondale's and NASSCO's under both the NCA and CAIG models. Racal Guardata, Inc., supra (prejudice is an essential element of a viable protest).

Shipyard-specific Efficiencies

The protesters also question NAVSEA's evaluation of shipyard-specific efficiencies. As noted above, NAVSEA adjusted its cost model to account for certain shipyard-specific efficiencies or inefficiencies relative to the T-AO 187 cost estimating relationship. These general adjustments included, for example: (1) a 5-percent reduction in NASSCO's and NNS's manhours and material dollars for certain ship's work breakdown structure groups (and a similar 5-percent efficiency factor accruing to Ingalls' benefit on the NNS subcontract) to account for the greater efficiency and bargaining position likely to result from the similarity in deck structure fabrication and auxiliary equipment installation between the new strategic sealift ship and the conversion ships for which NASSCO and NNS had received contracts; and (2) a 5-percent efficiency factor with respect to NASSCO's manhours to reflect its extensive new construction commercial experience. However, NAVSEA did not calculate separate cost estimating relationships for each ships breakdown structure group for each shipyard, and NNS and Ingalls generally argue that NAVSEA's failure to do so was unreasonable. In addition, NNS challenges NAVSEA's rejection of its BAFO learning curve (estimated by the agency as a [deleted] percent curve).

We conclude that NAVSEA's approach was unobjectionable. The protesters do not demonstrate on what basis, other than by simply accepting their general claims of greater efficiency, the agency could reasonably have calculated reliable shipyard-specific cost estimating relationships which would have furnished a materially better basis for estimating strategic sealift ship construction costs than those drawn from the T-AO 187 data (as generally adjusted by the agency). We agree with NAVSEA that the protesters have not established that the information reasonably available to the agency when it evaluated cost proposals demonstrated that the firms' shipyards have achieved materially greater efficiencies than were achieved on the T-AO 187, which the record indicates was constructed using technology and processes in current use. Certainly, the baseline ships cited by NNS and Ingalls in their proposals did not furnish a basis for calculating more reliable shipyard-specific cost estimating relationships. Since NNS and Ingalls are essentially military shipyards, for the most part their baseline ships were military ships, the data for which furnishes a poor basis for estimating the costs of construction to commercial standards (as will be done on the strategic sealift ships). Although NNS also cited in its initial proposal its experience constructing ULCCs, the last major commercial ship constructed by NNS, again, these ships were constructed in the 1970s using older technology and processes than used on the T-AO 187 and currently used.

Further, we consider it significant, as did NAVSEA, that the agency's cost estimating approach in fact resulted in a project cost estimate that was within [deleted] percent ([deleted] percent) of Ingalls' own initial target cost. While NAVSEA's initial estimate was [deleted] percent above NNS's initial target cost, NAVSEA's estimate for the BAFOs was only [deleted] percent higher than NNS's initial target cost, that is, only [deleted] percent higher than the target cost proposed by NNS before it learned of the award to Avondale (and the award price) and proposed a significant reduction in its target cost.

In these circumstances, it was reasonable for the agency not to attempt to calculate yard-specific cost-estimating relationships without adequate data. NAVSEA reasonably determined that the well-documented cost estimating relationships generated from the T-AO 187 cost data, supplemented by a few more general adjustments to account for particular material conditions of the offerors which were reasonably calculated to affect efficiency (e.g. the ship conversion awards and NASSCO's extensive commercial experience), were the most accurate basis for the cost evaluation.

Also, NAVSEA's decision to reject NNS's [deleted]-percent effective labor learning curve, and instead apply a 90 percent learning curve, was reasonable. (While a 90 percent learning curve assumes the sixth unit will be completed with 76.2 percent of the manhours needed to complete the first unit, an [deleted]-percent curve assumes the sixth ship will require only [deleted] percent of the effort.) In this regard, offerors proposed learning curves of approximately [deleted] percent in their initial proposals, with NNS proposing a [deleted] percent curve. This was consistent with the labor learning curves encountered in commercial construction, which generally range from 85 to 95 percent. Indeed, the NCA assumed a 96-percent labor learning curve, and although the CAIG viewed NAVSEA's learning curve as too conservative, it assumed a combined labor/material learning curve of 85.5 percent on the first 4 ships--which apparently translates into a labor learning curve of somewhere between 80 and 85.5 percent--and a 100 percent learning curve (i.e., no learning) on the later ships. We consider it particularly significant that, according to NAVSEA, the agency has not previously encountered a [deleted] percent labor learning curve on a major shipbuilding contract. Tr. at 73. (For example, on the T-AO 187, the labor learning curve was 93.2 percent.) Moreover, NNS's BAFO did not demonstrate that the proposed [deleted] percent learning curve was realistic; NNS neither documented its claimed labor savings on nuclear attack submarines and nuclear aircraft carriers (which the agency maintains are

overstated), nor explained why the data was not skewed by the significant performance and schedule problems encountered and the greater complexity of the ships, which were built to military, not commercial, specifications.

NASSCO Overhead Rates

NNS questions NAVSEA's acceptance of NASSCO's projected overhead rates. As noted above, NAVSEA used shipyard-specific overhead and labor rates for offerors. Although NAVSEA reduced Ingalls' overhead rates, the rates used for the other offerors were generally those proposed, since they generally did not vary significantly from the rates independently projected by the agency. As noted by the protester, NAVSEA initially questioned NASSCO's projected overhead rate of [deleted] percent, based on a workforce of [deleted]. The record includes a memorandum from one member of the price analysis team to another characterizing the NASSCO projection as "very risky"; the author of the memorandum instead predicted an average overhead rate of [deleted] percent for the 6 strategic sealift ships based on a projected average employment level at NASSCO of [deleted] for the period 1994 to 2001. Based on this memorandum, NNS maintains that the agency unreasonably ultimately accepted NASSCO's projected [deleted] percent overhead rate.

This argument is without merit. The memorandum also indicated that, during 1992, the most recent year for which actual data existed, employment at NASSCO averaged approximately [deleted] and the overhead rate was [deleted] percent. Further, in response to an agency discussion question, NASSCO explained the basis for its projection, noting: (1) prior reductions in fixed overhead during the period 1986 to 1987; (2) additional overhead savings it could achieve; (3) the fact that its initial proposal had been based on receiving award for two strategic sealift ship conversions, when it in fact was awarded three ship conversions; and (4) its projection of future business, including its expectation of the future demand for double-hull tankers required by environmental statutes and regulations. The member of the price analysis team (quoted from the memorandum above) conceded that while "I do not have the expertise to critically evaluate them," NASSCO's views concerning the tankers "sound good to me." He further conceded that, although "very optimistic," nevertheless, "in my opinion, given an average employment level of [deleted] and very aggressive managerial action, the [deleted] percent is achievable." In this regard, NAVSEA's director of cost estimating has testified that all of the shipyards are undertaking aggressive managerial action to reduce overhead. Tr. at 332. Thus, the critical issue was NASSCO's projected workload, especially commercial work, since NASSCO does more commercial work than the other shipyards. Noting that the

Navy "did not have a good projection of commercial work at times," NAVSEA's director of cost estimating testified that the agency ultimately determined to accept NASSCO's projected workload, and therefore its projected overhead rate. Tr. at 245-246, 329-333. NNS has not explained, nor is it otherwise evident, why it was unreasonable for the agency ultimately to conclude that NASSCO's workload was more likely to increase, as projected by NASSCO, than to decrease; therefore, we have no basis to question the agency's acceptance of the projected [deleted]-percent overhead rate.

We conclude that NAVSEA reasonably determined that Avondale and NASSCO submitted realistic prices; NNS and Ingalls failed to support the substantial price reductions in their BAFOs; NNS and Ingalls were likely to experience substantial losses as a result of the price reductions; and the protester's BAFOs therefore were unrealistically low.[5] NNS suggests that NAVSEA would have found the protesters' BAFO prices unrealistically low had the prices been expected to result in only $1 of loss; in fact, however, NAVSEA calculated that NNS and Ingalls would lose approximately [deleted] and [deleted], respectively, which the agency reasonably viewed as substantial sums. Tr. at 302-303. NNS

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[6]The record contains conflicting evidence concerning what specific information the agency requested during discussions. NAVSEA's written request for BAFOs did not specify what supporting documentation should be submitted. Two NAVSEA contracting officials testified, however, that while one of them was present, the other spoke by telephone with representatives of NNS and Ingalls; the officials testified that the protesters were specifically instructed to submit "the 4280 forms," that is, both the summary form 4280/2 and the detailed form 4280/2A, and the information required in Section L (Instructions to Offerors) of the solicitation. Tr. at 63-67, 166-171. In contrast, a representative of NNS and a representative of Ingalls testified that they were only told to submit the summary-level form 4280/2, and that the agency did not ask for the detailed form 4280/2A. Tr. at 462-466, 498, 935-949. Based on the detailed analysis the agency intended to perform and the testimony at the hearing, we find it more likely than not that NNS and Ingalls were instructed to submit both forms and the supporting documentation required by Section L of the solicitation. In any case, the Section L instructions expressly required offerors to submit form 4280/2A and detailed substantiating documentation in support of their proposals. Likewise, NNS was instructed in its initial discussion letter to "provide supporting data for any revisions" to its price proposal. (Price discussions with Ingalls were not necessary.)

also questions NAVSEA's apparent failure to consider NNS's ability to absorb the projected loss when making the price realism determination, Tr. at 299-303. However, the solicitation did not provide for considering financial condition in the context of the price realism determination (as opposed to a responsibility determination). Further, as explained by NAVSEA (and corroborated by the testimony of its director of cost estimating), a loss contract can create significant performance problems for the government which can affect the quality of performance, lead to contractor attempts to recover losses through the claims process, and poison the government's overall relationship with the contractor, irrespective of the contractor's financial ability to absorb the loss. Tr. at 297-299.

The protests are denied.

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Acting General Counsel